

# PSYCHE.

## THE LIFE-HISTORY OF SEIRARCTIA ECHO.

BY ALPHEUS SPRING PACKARD, PROVIDENCE, R. I.

In Entomologica Americana for August, 1889 (vol. 5, p. 153-155), Mrs. Annie Trumbull Slosson gives an interesting account of the occurrence of *Seirarctia echo* Abb. and Sm. in Florida, notes its habits and adds a description of the fully grown caterpillar, prepared by Mr. H. Edwards. She kindly sent me the eggs from Ormond, Fla., on the eve of my departure to Europe for the summer. These Mr. Joseph Bridgham kindly raised for me, and made excellent enlarged colored sketches of the larva in its different stages. As these are evidently faithful studies, and as Mr. Bridgham has drawn under my direction the early stages of other arctians, I think it will be safe to describe them from his drawings, although unfortunately none of the caterpillars were preserved in alcohol. The eggs are laid in Florida on the dwarf palmetto (*Sabal palmetto*); my specimens were fed on lettuce.

*Stage I.*—Length  $2\frac{1}{2}$ -3 mm.. Head nearly as wide as the thickest part of the body, being but slightly narrower than the prothoracic segment; in tint, dark brown, rather darker than the body; rounded. Body of the same thickness from the 1st thoracic to the 8th abdom-

inal segment. A transversely subclunate dorsal plate or rudimentary "conical shield" on the prothoracic segment bearing on the front edge a slightly curved row of six moderately large piliferous warts; behind which is a transverse row of smaller ones; the spinulate hairs arising from the larger warts are very long and project over the head. Behind this plate on each side is a single piliferous wart; farther down in front are two adjoining warts, and still farther down is another group of two similar warts.

The warts on the meso- and metathoracic segments are similar in shape, size and position. On each side of each segment is a group of three large warts, two of them coalesced, the third one below the others. On abdominal segments 1-8 there are two rows of small dorsal warts, two to each segment, which are *not present on the thoracic segments*. The arrangement of the subdorsal warts is the reverse of that of the two hinder thoracic segments; of the two sets of warts on each segment, the upper or dorsal is a single large one, and the two coalesced ones below are in the same position as the lower single one of the 2d and 3d thoracic segments. Lower down are three lateral rows of

piliferous warts, there being three warts on each segment; those of the uppermost row (each situated behind a spiracle) are the largest and arranged obliquely; those of the middle row are crescent-shaped; while those of the third row are minute and situated at the base of the legs, or in corresponding places on the apodal segments. It is to be observed that *the arrangement of the warts on the 8th segment is exactly the same as on the seven segments in front of it*. On the 9th segment there are two large subdorsal groups of three coalesced segments, the area either one of them occupies being the same as that covered by one of the double warts on the 2d or 3d thoracic segments. The suranal plate is roughened with crowded warts. The body is pale vandyke brown, the warts darker. The hairs are nearly twice as long as the body is thick, being long and sparse.

*Stage II.*—Length 4.5 mm. The head is a little smaller than before, but the body is of the same shape; the warts on the prothoracic shield are less pronounced, and the warts on the rest of the body preserve the same arrangement as before, but are decidedly smaller. The body is slightly more reddish in tint.

*Stage III.*—Length 7 mm. The head is now slightly narrower in proportion to the width of the body than before. There is now a great change in the nature of the piliferous warts, and a marked increase in the number of hairs. The prothoracic shield shows a tendency to divide into halves. The

primary piliferous warts have undergone a differentiation so that the surface has become covered with small secondary piliferous warts each bearing a hair one-half shorter than those of the preceding stages, so that the longest ones are about as long as the body is thick; the hairs are thus arranged in thin tufts or verticils. The two compound warts on the 9th abdominal segment are larger than before. The arctian features thus seem to be assumed in the third stage.

*Stage IV.*—Length 10-11 mm. The head is slightly smaller in proportion than before and now differs much in mode of coloration; there is a median pale stripe from the vertex to the front; the clypeus being pale, and connecting with a broad lateral pale band.

The prothoracic shield is now completely divided by a median line. The piliferous warts are somewhat smaller than before, but the hairs are of the same length. The position of the dorsal warts on the 2d and 3d thoracic segments have somewhat changed their position besides being smaller. They are arranged in a slightly curved line across the segment. The four dorsal ones on abdominal segments 1-8 are arranged more in a trapezoid than before. The two dorsal warts on the 9th segment are now about half as large as in the preceding stage. The general color of the body is more reddish than before, with a slight chestnut tint.

*Stage V.*—Length 15-16 mm. (Evidently underfed.) The head is marked as before, but the body is

considerably thicker. The markings of the body have materially changed. The prothoracic shield, in the two last stages split in two longitudinally, is now also split transversely, so that it is represented by four transversely narrow piliferous warts. On each succeeding segment there is a transverse dorsal broad black-brown band, which encloses a yellowish white narrow stripe, which in the middle and at each end enlarges into a round spot; there are ten such curious whitish stripes on a blackish ground, which only extend part way down the sides of the body toward the spiracles. The piliferous warts are not so pronounced as in the preceding stages, while the body and hairs are of a pale chestnut hue.

*Stage VI and last.* — Length 23-24 mm. (Evidently underfed, Mr. Edwards's specimens measuring 52 mm.). In the final stage the head is pale chestnut, with no black portion. The top of the body is now

black, and each segment except the first behind the head bears two transverse white stripes, one in front and the other behind a transverse chestnut-red band, enclosing the piliferous warts, which are much more prominent than in the 5th stage. Of the two yellowish white transverse stripes, the one on the front of the segment is divided into a central dot with a separate slash on each side; the hinder band consists of three portions, a central dot, from which a stripe passes each side, and instead of ending in a dot, makes a loop or hook. Our drawings made by Mr. Bridgham agree well with Mr. Edwards's description.

It thus appears that the markings of the two last stages of this larva are very different from those of any genus whose larval history is known to us; Mr. Edwards has pointed out its relations to the larva of *Arachnis* and *Ecpanteria*, with which we are not familiar.



## TWO SPECIES OF AESCHNA.

BY HERMANN AUGUST HAGEN, CAMBRIDGE, MASS.

### I. *AESCHNA SITCHENSIS*.

*Aeschna sitchensis* Hagen, Syn. Neur. N. A. 119, 1.

Blackish-brown, spotted with blue; head yellow in front, anteriorly with a narrow transverse black line; superiorly a large black spot in the shape of a  $\tau$ , nearly or entirely connected each side

with a black band before the eyes, forming two yellow spots surrounded with black on the superior part of the front; rhinarium and border of the labrum black; eyes largely connected; occiput yellow, hind border elevated, black on each side; thorax fuscous, dorsum with two median elongated points; sides